

The '90s Rave sound was defined by experimenting with basic gear and creatively working around restrictions. Let's look at how we can recreate that approach today

RAVE REVISITED

The frenetic breakbeats, bouncing basses, warped vocals and distinctive piano stabs of early Rave and Breakbeat Hardcore records provided the soundtrack for many a youth growing up in the early '90s. This style of music evolved from the Chicago Acid and Detroit Techno scenes that crossed the pond to UK and European shores in the late '80s, and was a sound sculpted by a new generation of producers who no longer needed advanced music theory skills and access to pro studios to make music. For the first time, any wannabe producer could gather a budget home studio set-up and sequence speaker-shaking tunes geared towards the raves of the day.

Despite the fact that early Rave music sounds rather dated when compared to today's standards, many of us still harbour a deep-rooted love for those iconic sounds that laid the blueprint for all the subgenres that followed. Most modern forms of electronic music still feature plenty of nods to those tearing stabs, plastic pianos, chopped Funk breaks and processed vocals that we know and love. With that in mind, let's look at how to recreate these classic elements and achieve authentic retro Rave sounds in the modern world.



Replicating The Rave Producer's Gear

To recreate the iconic sounds of early Acid House and Rave music, it's important to grasp how the tracks were originally created. In contrast to glossy Pop music created in expensive studios, cash-strapped electronic musicians squeezed the most out of limited resources and budget equipment: a typical bedroom or garage studio would house a hardware sampler, MIDI sequencer, drum machine, a second-hand synthesizer or two, and a multi-track tape recorder. This limited set of tools may seem primitive in today's age of affordable DAWs, hardware and plug-ins, but the gear, and the workflow these tools encouraged, led to the innovative

production techniques that give early Dance music its character.

The hardware sampler was the centrepiece of the Rave producer's studio and is responsible for the majority of sound-mangling techniques we associate with Rave sounds. While expensive samplers like the Fairlight had been around for several years, it was the introduction of affordable samplers such as the Akai S-series that gave bedroom producers access to a whole new world of sound sources. These samplers operated in 12-bit, giving the resulting audio a distinctive grainy quality. When replicating early sampling techniques using today's software samplers, the tools we use

today are too clean and 'pristine' to achieve this gritty sound in the box. Insert a bit-reduction plug-in – set to 12-bit mode – after your sampler in the signal chain to impart that authentic sampler colour. While all DAWs feature a basic bitcrusher, a good plug-in for this task is D16's Decimort 2, which features presets designed to emulate various old samplers. Another choice plug-in is Togu Audio Line's TAL-Sampler, a soft sampler that allows you to dial in various sampler DAC settings within the signal path for even more realistic sample degradation.

While the Rave producer used almost any second-hand synthesizer or sound module they could get their

hands on, most '70s/'80s synths were too expensive for the average home musician, so the bulk of a producer's source sounds were either from commercial sample libraries or sampled directly into the sampler from existing records. To produce authentic Rave music, begin by gathering some classic sample CDs: the Zero G Datafiles series and *Future Music's* first ever cover CD are just two examples of popular sample collections, but you can find a whole list at www.musicradar.com/news/tech/10-classic-sample-libraries-that-changed-music-631133.

Audio samples and software emulations get you 90% of the way to the classic sound of hardware samplers, but for true authenticity seek out the original kit from the era: early samplers, sound modules and digital synths can be picked up on the second-hand market for bargain prices and, while learning curves can be steep, the raw sound of the equipment will outweigh the hassle of integrating fiddly samplers and budget outboard into your set-up.

Rave synths

As this is issue 303 of *FM*, we have to give a nod to the silver box responsible for the squelching sounds of Acid House and Rave. Roland's TB-303, designed as a bass guitar accompaniment, was first misused by Chicago's DJ Pierre in the mid-'80s. After obtaining a second-hand '303' for just \$40, he tweaked and distorted the synth's simple oscillator into wild, screaming territories to create a bubbling underground groove that was played four times in one night by influential DJ Ron Hardy at Chicago's infamous Musik Box. Phuture's *Acid Tracks* was born: a record that spawned the entire Acid House genre and introduced the concept of DIY Dance music.

The TB-303 is deceptively simple considering its cult status. The monophonic instrument features only a single oscillator, resonant filter,

sequencer, and a single envelope shared between both the filter and amplitude. Its unique features are its awkward sequencer, within which 'accented' notes are programmed, and a distinctive slide function which gives the sequenced notes their slippery glide. While the basic 303 features can be replicated with most

capable subtractive synths, many of the subtle nuances of the hardware can be lost. But plenty of emulations (both hard and soft) are available: check out AudioRealism's ABL3 and D16's Phoscyon for viable plug-in alternatives that are a lot cheaper than a second-hand 303. Or, if tweaking the silver knobs is a priority, hardware lovers should try replicas such as Cyclone Analogic's TT-303 BassBot, Ladyada's xOxbOx, and Roland's recent recreation, the TB-3.

Keep it digital

When it came to synthesizers and sound modules of the Rave era, digital technology was coming into its own, with many producers even

trading in their analogue synths for sample-based digital instruments. The most popular was the Korg M1, a multi-timbral digital synth that combined sample-based oscillators and realistic instrument tones with subtractive synthesis techniques, an eight-track sequencer and multiple effects. The machine's various presets have appeared on countless House, Rave and Pop records – the lead organ from Robin S's *Show Me Love* and the piano sound in Snap!'s *Rhythm Is A Dancer* being just two examples – making it the go-to sound source for cheap-sounding pianos, shimmering pads, fake choir stabs and other typical '90s sounds. While second-hand units are commonly found, save studio space by checking out Korg's M1 in plug-in form, an enhanced software replication that comes bundled alongside several other classic Korg synth emulations as part of the Korg Legacy Collection – and even packs in extra features such as filter resonance and the full collection of 'expansion cards' available for the original hardware.

Other noteworthy digital synths of the era include the Casio CZ range, the Roland D-50 and the famous Yamaha DX7, with the latter's FM synthesis technology emulated admirably by Native Instruments' FM8 soft synth. Rack-mounted digital sound modules and ROMplers such as the E-mu Proteus, Roland JV-1080 and JV-2080 were also relatively commonplace in the '90s; these rack units could be loaded full of additional presets, with the Roland Techno and Dance expansion cards featuring plenty of recognisable '90s sounds that still hold their own today.

While it's tempting to play these sounds back directly from the source synth in your projects, remember that many Rave producers couldn't afford DX7s or Junos, instead scouring sample packs for one-shots to load into the trusty sampler. Listen to many Rave tunes, and you'll hear the sampler transposition artifacts as higher notes sound shorter than lower notes – to recreate this effect, apply bitcrushing and saturation for grit, sample one short note of bass, then load this note into a soft sampler for retriggering. Also try setting your sampler's loop regions around a small section of a brief sound to extend its sustain, achieving the grainy sustain and looping that was a byproduct of short sampler memory.



Classic Rave Vocals

The '90s was the decade of unashamed vocal sampling, so let's travel back in time and reproduce the effect

In contrast to the copyright-savvy music industry of today, early '90s artists sampled vocals from anywhere and everywhere. Screaming diva vocals extracted from acapellas soared over breaks and piano riffs to give a euphoric edge; Hip-Hop and Rap acapellas were also widely used, and even short snippets of dialogue from movies were dropped in. In many cases, multiple vocals were exuberantly spliced together to form a collage of whoops, roars and rhymes. Vocals were used as a rhythmic or synthesized element as well as a core musical device. Exaggerated chopping, repeating, pitchshifting and mangling were at the core of the Rave scene as sampler manipulation was pushed to new heights. Replicate these effects in your DAW by treating the vocal as a raw tone to be twisted up in a whole host of ways.



Begin with a vocal sample. Rave producers didn't discriminate when sampling, so any source is fair game – we're using a breathy spoken vocal, but you can use a diva-style phrase, film snippet or even a cartoon character.



Pitched-up 'chipmunk' vocals are a Rave trademark, so load the vocal into a sampler and pitch it up by a few semitones. Don't worry about the vocal's length, as we'll alter that in the next step.



The distinctive 'cyclick' Akai time-stretching algorithm was used plentifully in the early '90s, so use your sampler's time-stretching features to stretch and warp the vocal out for two or four bars. This effect is all about extremities, so the more artifacts the better.

Creating A Layered Rave Stab Using Korg's M1

The obvious way to incorporate Rave stabs in your music involves sampling the classic hits from old records – but synthesizing your own stab is easier than you might think...



➤ Let's create a custom Rave stab using several bespoke layers from Korg's M1 plug-in. Start with a typical M1 piano layer, then program a minor chord on the track by either drawing in MIDI notes or by using a 'chorder' MIDI plug-in.



➤ Many old-school stabs feature a hint of choir or vocal, so duplicate the first M1 instance and seek out a suitable preset within this second instance. We've chosen to disable the preset's overt effects, giving a cleaner result.



➤ Now it's a case of layering another one or two patches on separate channels to thicken the overall chord sound. At this stage, you may find you need to tweak individual note velocities of each chord in the mix to prevent certain notes from dominating others.



➤ Now group your stab layers to a single buss. You may wish to tweak each layer's ADSR individually, but we've inserted LFOTool on this buss and drawn in a volume curve sloping downwards, giving the overall sound a more appropriate stab-like envelope.



➤ Applying effects to the group as a whole will gel the layers and achieve a harsher, retro sound. We're using heavy parallel saturation from Soundtoys Decapitator and two lots of bitcrushing from D16 Decimort 2 to really push and crunch the stab.



➤ Bounce down a one-shot of the processed stab, load it into a sampler, then program a suitable Rave-esque MIDI riff. For the finishing touches, we've applied sampler hiss, crushing and delay via the sampler's onboard effects, then extra weight is added via an analogue-style EQ.

Rave breaks and beats

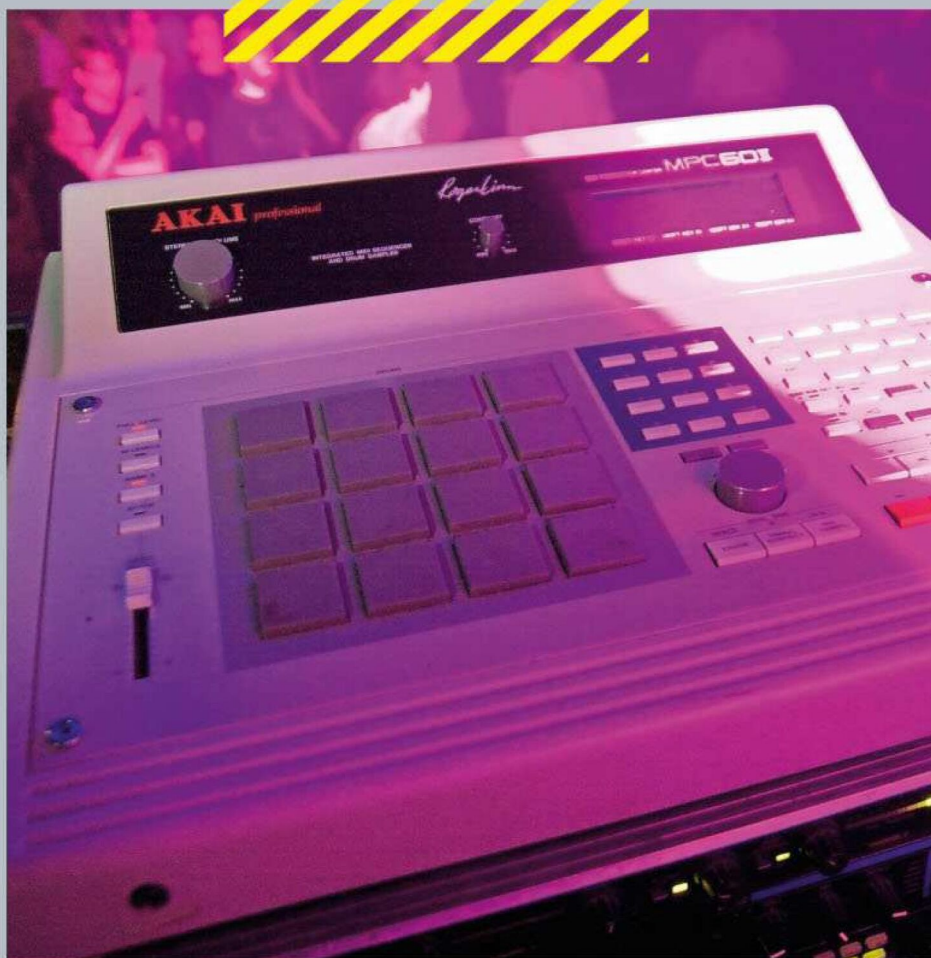
Before sampling, House producers sequenced and tweaked basic beats in live via hardware drum machines, recording the tracks directly to a multi-track tape recorder or DAT. Once the sampler became affordable, Rave producers began to expand their sonic palette by sampling entire drum breaks from old records, often layering these vibe-laden grooves with four-to-the-floor drum machine patterns for maximum dancefloor impact. Either the original breakbeat would be sampled directly from the source record, or artists would lift breaks from their peers' tunes, which had been layered and processed further. For authentic Rave breaks, fill your hard drive with as many breakbeat samples as you can: obvious examples are the iconic *Amen*, *Funky Drummer* and *Think* breaks, but there are hundreds more.

Sampler time-stretching wasn't as advanced as today's software, so producers would transpose breakbeats by ear until the loop fitted the tempo, resulting in the slightly loose timing that's a signature sound of early '90s Rave music. When emulating this effect in your DAW, forget precise time-stretching algorithms and warping methods; load an entire breakbeat into a sampler, then play it back up and down the keyboard until

it fits your project's tempo (set your sampler to a traditional 'repitch' mode or similar, so the break's speed changes with pitch).

Once approximately in time, these breaks – often two or more layered – would be resampled back into the sampler for further manipulation. Slicing a break into individual slices was a time-consuming process; duplicate copies of the break would be mapped across different key zones, and then the start point of each break was moved to a different point in the loop. This way, triggering different MIDI notes would start the break at a different point, creating various chops, edits and fills. So, when resequencing your own Rave breaks, forget super-accurate auto-slicing and try the old-skool approach.

Recreating the workflow of classic samplers will help you achieve that 'loose' feel of classic Rave tracks



Rave bass



While Acid House relied on the TB-303 and pounding kicks to give low-end weight, producers took the concept of 'bass' even further, exploring the advanced sampling and synthesis techniques of the day in the search for stack-shuddering subs and in-your-face bass tones. Many early Rave and Breakbeat Hardcore tunes feature a muddy bass 'rumble' sitting

under hectic breakbeats, serving as a precursor to the Hardcore Techno and Techno basses that followed. It's an atonal effect that can be recreated by smothering a pitched-down kick sample in reverb, monoing the effect, then bouncing and resampling the note before programming and tweaking the sound further.

Much of early Rave took inspiration from the bass-obsessed

Reggae scene, utilising clean sine tones and TR-808 kicks to swamp the sub region with pure weight. One of the most used sine bass tones was the default patch on the Akai S900 and S950 samplers; later, Jungle producers would take this patch and either detune two layered copies or simply play two adjacent notes on the keyboard, resulting in the classic 'wobbly' sine bass heard in Jungle classic *Valley Of The Shadows* by Origin Unknown – a bass that's still popular in D'n'B and House today.

Rave's most famous offshoot genre was Happy Hardcore. The most distinctive Rave and Hardcore basses were the bouncy, quirky stabs, detuned notes and 'donks' heard in plenty of early '90s tracks. These are usually fairly simple to synthesize: for example, the initial bass part heard in The Prodigy's *Everybody's In The Place* can be recreated by detuning two square wave oscillators in opposing directions, being sure that oscillator phase is set to 'retrigger' to give a solid and consistent sound. The classic FM 'donk' bass is also a doddle to program: use an FM synth to layer two sine waves, one an octave above the other, and use the higher sine to trigger FM over the first using a tight, plucky envelope.

QUICK TIPS

Be sure to scour eBay for great deals on second-hand kit from the Rave era. Obviously analogue classics such as Junos and Jupiters are continually soaring in value, but '90s digital synths and rack gear can be picked up for peanuts.

Of course, if you don't have the funds to kit your studio out with the actual gear used, then you'll want to fill your hard drive with plug-in emulations that do a similar job. One of our favourites is TAL's BassLine-101, which admirably replicates the SH-101.

Apply medium-length reverb to a stab, resample the sound with the reverb baked in, then cut off the end of reverb tails abruptly for a choppy, sampled feel.

Use your sampler's looping features to extend short samples into sustained sounds, as a '90s producer would to save sampler memory.

Three Classic Rave Bass Sounds

Everyone loves a bit of 'ardcore bass, so let's create a trio of classic '90s bass sounds that are guaranteed to put a smile on old ravers' faces

Bass sounds are usually the most simple to synthesize from scratch and, although most Rave artists used samples, the sounds they were pilfering are child's play to build using any standard synth plug-in. For true authenticity, you'll want to stick to synthesizers with a similar architecture to those around in Rave's heyday – so think TB-303 emulations, simple subtractive designs such as the Roland Juno or SH-101, or perhaps digital or FM offerings that replicate Yamaha's DX7 or Korg's Wavestation. In this tutorial we'll take a brief look at a handful of classic Rave bass sounds. All three patches are fairly easy to replicate – either with emulation plug-ins or a bit of synthesis know-how – so be sure to check out our audio examples (downloadable from vault.futuremusic.co.uk) and hear our attempts.



Acid House's signature squelching bass, generated by the Roland TB-303, is a synth sound that never seems to go out of fashion. AudioRealism's ABL3 is one of the most accurate software replicas. Here we distort and chorus the sound before tweaking parameters live.



Another signature Rave bass involves detuning two square waves in opposing directions, creating a harsh stab that's reminiscent of early Prodigy tracks. In this example, we've used a retro reverb plug-in and bitcrushing to dirty up the bass.



FM synthesis is responsible for the classic 'hollow' bass patch that's been a mainstay in House, Rave and Garage for years. Simply use a sine wave to modulate the frequency of another via a short envelope. Again, reverb and bit reduction add tasteful grunge.

How to...

Program
Rave Riffs/
Sequences

➤ Fast-paced piano and stab riffs – sequenced using hectic 8th and 16th notes spanning two or more octaves – are distinctive of Rave, paving the way for the hands-in-the-air supersaws of Happy Hardcore/Trance. Music theory laymen were able to compose seemingly-complex riffs using a little programming know-how. After loading up a one-shot sample of a chord in a sampler, they'd play this note up and down the keyboard to form a recognisable 'stacked' chord riff. It was borrowed from Chicago House, but taken to pacier extremes using the accelerated bpm's and eccentric chord stabs of Rave.

How to...

Synthesize
Cold, Digital
Pads

➤ In the mid-to-late-'80s many embraced new forms of synthesis such as the Yamaha DX7's frequency modulation (FM) and the Korg Wavestation's wave sequencing technology. This can be heard in the Rave tunes of the era, and especially in the shimmering, evolving pad sounds heard in tracks such as Zero B's *Lock Up*. To recreate these types of pads, use slow ADSR envelope settings, plus plenty of filtering, resonance and modulation. Don't get hung up on analogue or VA synthesis: turn to FM or wavetable synths to build harmonically-complex and evolving textures you'll never coax out of a Moog.

How to...

Use Volume
Manipulation
And Silence

➤ The sloppy, choppy nature of primitive sampling gives old-school tunes their personality. Often, modules were sync'd up by hand, then the sounds were all recorded in live from the sampler or mixing desk directly into the multi-track tape recorder or DAT machine. This live approach led to on-the-fly mutes, solos, volume fades and chops – essentially 'happy accidents'. Listen to popular Rave and Hardcore and you'll notice how parts don't always fade out perfectly, and samples are cut off abruptly mid-reverb. Recreate this in your DAW by recording chops, cuts, transitions and edits in live via a MIDI controller.

How to...

Create Rave-
Style Sound
Effects

➤ As Rave artists realised they could use any recorded sound as an oscillator, they sought out more outlandish samples in the race to differentiate their sampling prowess from the competition. Whistles, horns, crowd noise, dog barks, laughter, movie snippets and cartoon-style 'boings' are just a few examples. To emulate this sampling naivety, loop up a one- or two-bar MIDI note then use your sampler's browser to cycle through folders of random sounds on your hard drive. Once you hit upon a sound that might fit, head for the sampler's transpose dial and pitch your new sound effect to fit your track.

DIY effects



Using creative techniques to work around the limitations of your gear was one of the defining attitudes of the Rave era. Recreate that approach by thinking outside the box when creating effects.

In the modern studio, if we need a reverb or delay on multiple channels, we can pile on as many plug-in inserts as we need in a project to get the job done. Rave producers didn't have this luxury: budget hardware samplers featured few effects, and decent outboard rack units weren't always cheap. Listen to early '90s Dance music, and you'll notice a distinct lack of obvious effects.

These restrictions forced producers to think outside the box and come up with DIY effects using the tools they had available. To generate a phaser effect on a budget, they'd layer two copies of the same signal in a sampler before nudging one ever so slightly out of time with the first. Another common technique involved creating basic delay effects by simply repeating notes of the same sound over and over – for example, with the second note set to 75% volume, the third note to 50%, the fourth to 25%, and so on.

The 'Hoover' – we talk to AudioRealism

Having appeared on seminal records such as Second Phase's *Mentasm* and The Prodigy's *Charly* amongst others, the aggressive,

whirling roar of the hoover stab – originally the WhatThe factory preset on the Roland Alpha Juno 1 and 2 hardware synths – is one of the most iconic sounds to emerge from the '90s Rave scene.

We sat down for a chat with Mike Janney of AudioRealism, the minds behind ReDominator – the most authentic software replica of the Alpha Juno.

What has been your relationship with the iconic 'hoover' sound over the years?

"The first time I recognised the hoover was back in 1991. I was active in the demo scene, which



consisted of parties where we would compete by creating music and real-time graphics generated on 8 and 16-bit machines. The first time I heard the hoover sound was on a bus trip to one of these parties; someone was playing *Dominator* by Human Resource and I was instantly hooked on the hoover sound. These days it's more used as a gimmick or as a nod to the retro Rave scene, but I still light up whenever I hear one in a track!"

How exactly is the hoover sound synthesized within the Roland Alpha Juno?

"That sound is very dependent on the architecture of the Alpha Juno. It uses all three waveforms of the Alpha Juno at the same time, with the Pulse and Saw using pulse width modulation, plus the sub oscillator is also switched on with full volume. The PWM rate and modulation is very fast and deep. The hoover sound doesn't really use the filter much;

instead, the rather unique envelope of the Alpha Juno is used to modulate the pitch and VCA. Since the envelope features an extra decay stage, the particular shape of that pitch modulation creates a very distinct sound which I think only the Alpha Juno (and clones) can produce. Finally, the distinctive Roland chorus is turned on, with a fast modulation rate applied."

Can the hoover be accurately recreated using common software/hardware synths and effects?

"There are a lot of synths that can produce hoover type of sounds: for instance, I found a few faithful hoover presets in Xfer's Serum. Our ReDominator synth attempts to emulate the Alpha Juno as closely as possible, so it can do a rather authentic hoover – but many of those recordings used a sampled version of the hoover rather than a real Alpha Juno, so in order to get that old-skool sound from the early '90s I would recommend using a bitcrusher, sample rate reduction or some other kind of distortion and run the hoover through this."

Can you tell us how to work with the hoover found in ReDominator?

"The patch set-up in ReDominator is in fact the exact same as on a real Alpha Juno since they have exactly the same parameters. In fact, it's possible to export a Sysexp dump of an Alpha Juno and import that into ReDominator. However, the real fun comes from modulating different parameters that control the sound in real time – for instance, instead of just using a one-shot hoover, try changing the envelope settings while holding a note, then add outboard FX to really crunch it up a bit."

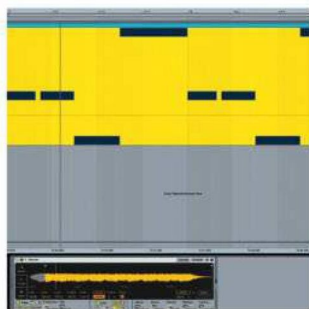
Hoover Resampling

Seeing as the hoover is best mangled within a sampler instrument, let's take a look at how to resample it effectively

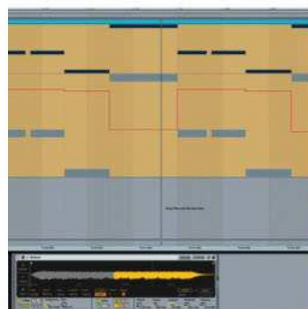
The hoover was created by Spectrasonics boss Eric Persing during his time as chief sound designer for Roland back in the '80s (read the full story at www.musicradar.com/news/tech/spectrasonics-eric-persing-talks-omnisphere-2-sound-design-and-more-616236). Originally designed to be a quirky, animal-like 'roar' effect that sat at the rear of the synth's preset bank, the Alpha Juno preset quickly gathered a cult following when a twisted, processed hoover riff appeared on Second Phase's *Mentasm*. It's rumoured that the sound, dubbed 'the mentasm', was then lifted from that track by The Prodigy, who brought it to a wider audience through its use in *Charly*. Since then, many have sampled the hoover from other records such as these, perpetuating a sampling culture based upon recycling and one-upmanship.



We'll begin by sampling the Kiss Myself preset from AudioRealism's ReDominator synth, a virtual emulation of the Roland Alpha Juno. As with most of the audio throughout our tutorials, bitcrushing and saturation is used to emulate old '90s gear.



A rendered audio file of the processed hoover is loaded into a sampler. Changing the sampler's start point has a dramatic effect on the resulting sound due to the sample's inherent pitch bend. We program a simple repeating riff.



Many classic Rave tracks used a version of the hoover that begins midway through the note, removing the pitch slide to create a more melodic riff. For best results, you can automate the sampler's start time for different riff notes, adding variety and character.

Back in the '90s, how did producers process and manipulate the hoover? How did this impact the sound that we're used to hearing, and how can we emulate those processes with modern gear/software?

"They sampled the Alpha Juno and processed that sound in various ways. The Akai S900 was pretty popular with its 12-bit sampling – perhaps we should bring an emulation of the S900 A/D converter into the next version of ReDominator! Other than that, any bit/sample rate reduction and tape compression plug-in will help recreate that early '90s sound."

Building A Layered Rave Breakbeat

Rave beats were often created by layering multiple drum loops together, using transposition to get things sitting roughly in time...



➤ Start with a couple of breakbeat loops that are approximately 120bpm in speed. Set your DAW's bpm to 150, then load these two breaks onto separate channels in a sampler. We've added a bitcrusher on the master channel for an added dose of darkness and grit.



➤ Turn on your host's metronome, then create a bar-long C3 note within a new MIDI region on the sampler channel. Mute the second break, then alter the break's Transpose and Fine Tune parameters until it's roughly in time with the click. Repeat the process with the second break.



➤ Next, emulate the crustiness, glue and grit of a hardware sampler with processing. Bitcrushing, saturation and heavy compression work well, but we'll use TAL-Sampler's DAC Resampling features here for added authenticity. We've also applied the sampler's onboard EQ to roughly brighten the layered breaks.



➤ You may need to apply modern techniques to gently customise and enhance things. The bass region in our layered loop is lacking, so we've used a bass boost and dynamic EQ combo to help the kick poke out a little more. Another snare layer adds snap.



➤ Bounce the break down to audio once you're happy with it. From here, you can either rearrange sections as audio on your DAW's arrange page or load several copies in a new sampler and trigger them from different points to create stutters, chops, fills and edits.



➤ Many early Rave tracks featured drum machine sounds layered alongside break samples. For sub weight, we've added a TR-808 kick playing 4/4 notes, then a dash of TR-909 hi-hats add extra percussive interest.